REMARKS

By this Amendment, claims 1-8 are cancelled, and claims 9-18 are added. Thus, claims 9-18 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised in order to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Also attached hereto is a marked-up version of the substitute specification and abstract illustrating the changes made to the original specification and abstract.

The Applicant thanks the Examiner for kindly acknowledging the Applicant's claim of foreign priority based on Japanese Patent Application No. 2000-400870, filed December 28, 2000. A certified copy of the foreign priority document is submitted concurrently herewith under a separate cover letter entitled Claim of Priority. The Applicant respectfully requests the Examiner to acknowledge receipt of the certified copy of the foreign priority document.

In item 2 on page 2 of the Office Action, claims 1-8 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. In particular, the Examiner identified various examples of limitations in claims 1 and 2 which lack proper antecedent basis.

This rejection is believed to be moot in view of the cancellation of claims 1-8. Furthermore, the Applicant respectfully submits that new claims 9-18 have each been drafted so as to provide proper antecedent basis for all of the recited limitations. Accordingly, the Applicant respectfully submits that this rejection is inapplicable to new claims 9-18.

In item 3 on page 4 of the Office Action, claims 1-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tarui et al. (U.S. 6,510,496, hereinafter "Tarui") in view of Koenck et al. (U.S. 6,714,983, hereinafter "Koenck").

This rejection is believed to be moot in view of the cancellation of claims 1-8. Furthermore, the Applicant respectfully submits that this rejection is inapplicable to new claims 9-18 for the following reasons.

The present invention provides coupled-type computers in which computers of a same structure are coupled to form an ensemble-type computer. In particular, the present invention provides that a holder 4 is formed by a hexahedral polyhedron cube, and a plurality of computer components 6, 8 are housed in the holder 4. The present invention also provides that a radio propagation bus space 10 is formed by a cavity provided in an inside region of the holder 4. Furthermore, the present invention provides that a plurality of radio-electric signal interconversion elements 12, which are operable to identify a signal, are respectively connected to corresponding computer components 6, 8 among the plurality of computer components 6, 8, and the plurality of radio-electric signal interconversion elements 12 are each disposed so as to face the radio propagation bus space 10 in the holder 4.

In addition, the present invention provides that a plurality of radio lines 16 are provided on the holder 4, where the plurality of radio lines 16 are each operable to communicate by radio propagation with the radio propagation bus space 10 such that the plurality of radio lines 16 are mutually communicated with the plurality of radio-electric signal interconversion elements 12.

Moreover, the present invention provides that holes provided on each surface of the holder open the radio propagation bus space 10 to each surface of the holder 4, and the holes provided on each surface of the holder 4 enable the plurality of radio lines 16 to mutually communicate with a plurality of radio lines 16 of at least one other identically structured holder 4 that is placed side-by-side with the holder 4 by arranging the radio propagation bus space 10 of the holder 4 to communicate with a radio propagation bus space 10 of the at least one other holder 4 placed side-by-side with the holder 4.

Accordingly, by this structure, the present invention provides that each of the computer components 6, 8 housed in the holder 4 is operable to perform data exchange with computer components 6, 8 of the at least one other holder 4 placed side-by-side with the holder 4 through transmission and reception of radio by the plurality of radio-electric

signal interconversion elements 12 respectively corresponding to each of the computer components 6, 8 (see Figures 1-3 of the present application).

New claim 9 recites the coupled-type computers of the present invention, and new claim 14 recites a method for coupling computers.

In particular, new claim 9 recites that a holder formed by a hexahedral polyhedron cube houses a plurality of computer components, and a radio propagation bus space formed by a cavity is provided in an inside region of the holder. New claim 9 also recites that a plurality of radio-electric signal interconversion elements, which are operable to identify a signal, are respectively connected to corresponding computer components among the plurality of computer components, and that holes provided on each surface of the holder open the radio propagation bus space to each surface of the holder.

New claim 14 recites the method as comprising housing a plurality of computer components in a holder formed by a hexahedral polyhedron cube, forming a radio propagation bus space composed of a cavity in an inside region of the holder, disposing a plurality of radio-electric signal interconversion elements for identifying a signal so as to face the radio propagation bus space in the holder, and connecting the plurality of radio-electric signal interconversion elements to the plurality of computer components housed in the holder, respectively. Furthermore, the method of new claim 14 is recited as comprising forming a plurality of radio lines on the holder, where the plurality of radio lines are formed to communicate by radio propagation with the radio propagation bus space such that the plurality of radio lines are mutually communicated with the plurality of radio-electric signal interconversion elements, and opening holes on each surface of the holder to open the radio propagation bus space to each surface of the holder by means of the radio lines formed in the holder.

These features of the present invention, as recited in new claims 9 and 14, are not disclosed or suggested by either Tarui or Koenck. In particular, Tarui discloses that a plurality of nodes 100-800 (see Figure 2) are each connected by a bus line 900, but Tarui does not disclose or suggest that a holder formed by a hexahedral polyhedron cube houses a plurality of computer components, a radio propagation bus space formed by a cavity is provided in an inside region of the holder, a plurality of radio-electric signal interconversion elements, which are operable to identify a signal, are respectively

connected to corresponding computer components among the plurality of computer components, and holes provided on each surface of the holder open the radio propagation bus space to each surface of the holder, as recited in new claims 9 and 14.

Moreover, Tarui also fails to disclose or suggest the holes provided on each surface of the holder enable the plurality of radio lines of the holder to mutually communicate with a plurality of radio lines of at least one other identically structured holder that is placed side-by-side with the holder by arranging the radio propagation bus space of the holder to communicate with a radio propagation bus space of the at least one other holder placed side-by-side with the holder, as recited in new claims 9 and 14.

Similarly, Tarui also fails to disclose or suggest that each of the computer components housed in the holder is operable to perform data exchange with computer components of the at least one other holder placed side-by-side with the holder through transmission and reception of radio by the plurality of radio-electric signal interconversion elements, as recited in new claims 9 and 14.

Similar to Tarui, Koenck also fails to disclose or suggest that a holder formed by a hexahedral polyhedron cube houses a plurality of computer components, a radio propagation bus space formed by a cavity is provided in an inside region of the holder, a plurality of radio-electric signal interconversion elements, which are operable to identify a signal, are respectively connected to corresponding computer components among the plurality of computer components, and holes provided on each surface of the holder open the radio propagation bus space to each surface of the holder, as recited in new claims 9 and 14.

Furthermore, similar to Tarui, Koenck also fails to disclose or suggest the holes provided on each surface of the holder enable the plurality of radio lines of the holder to mutually communicate with a plurality of radio lines of at least one other identically structured holder that is placed side-by-side with the holder by arranging the radio propagation bus space of the holder to communicate with a radio propagation bus space of the at least one other holder placed side-by-side with the holder, as recited in new claims 9 and 14.

In addition, similar to Tarui, Koenck also fails to disclose or suggest that each of the computer components housed in the holder is operable to perform data exchange with

computer components of the at least one other holder placed side-by-side with the holder through transmission and reception of radio by the plurality of radio-electric signal interconversion elements, as recited in new claims 9 and 14.

Accordingly, Tarui and Koenck clearly fail to disclose or suggest each and every limitation. Therefore, no obvious combination of Tarui and Koenck would result in the inventions of new claims 9 and 14 since Tarui and Koenck, either individually or in combination, clearly fail to disclose or suggest each and every limitation recited in new claims 9 and 14.

Furthermore, it is submitted that the distinctions discussed above are such that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Tarui and Koenck in such as manner as to result in, or otherwise render obvious, the present invention as recited in new claims 9 and 14.

Therefore, it is submitted that the new claims 9 and 14, as well as new claims 10-13 and 15-18 which depend therefrom, are clearly allowable over the prior art as applied by the Examiner.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

A fee and a Petition for a two-month Extension of Time are filed herewith pursuant to 37 CFR § 1.136(a).

Respectfully submitted,

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~~SECIFICATION~~ Version with Markings to Show Changes Made

~~Title of invention:~~

Coupled Computers ~~computers~~ and a Method ~~method~~ of Coupling Computers ~~coupling Computers~~

BACKGROUND OF THE INVENTION~~:~~

1. Field of the Invention

The present invention relates to coupled computers forming coupled computers which are ~~consisting of computers~~ capable of conducting a transfer of a large amount ~~of number~~ of data with each other, and a method of coupling the computers.

2. Description of the Related Art

Heretofore, ~~It has been heretofore carried out that~~ a large number of computers have been ~~are~~ coupled to form an ensemble-type ~~ensemble type~~ super computers, and this aggregate ~~magnitude~~ of computers is used as a server forming a data center of an ASP (Application Service Provider) or is used as a super computer performing a large scale scientific calculation. The coupling between each computer is generally served by codes.

In a case where an ensemble-type ~~ensemble type~~ super computer is formed by forming a cluster connection of a large number of computers, the ~~a~~ volume of such an ensemble of an entire super computer becomes an enormous size which is extremely inconvenient.

Furthermore, there exists ~~was~~ a problem in that the codes coupling each computer becomes a huge volume which makes an entire accommodating space big. Moreover, there exists ~~was~~ a problem in that a linking operation of each computer was extremely cumbersome as well as ~~and yet such operation was a~~ time consuming ~~one~~.

An object of the present invention is therefore to solve the foregoing problems.

SUMMARY OF THE INVENTION~~:~~

The present invention provides ~~is to provide~~ coupled type computers wherein a computer is coupled to another computer of an identical structure easily, and moreover, is coupled to another computer with the same structure in high density without requiring codes.

The present invention is provided with ~~a~~ built-in computer components such as CPU, memory and the like in a holder formed by a polyhedron cube. The present ~~This~~ invention forms a radio propagation bus space consisting of a cavity in the interior of the holder, and a plurality

of radio-electric ~~radio.electric~~ signal interconversion elements provided with a signal identification means is installed in the holder which faces the radio propagation bus space. These radio-electric ~~radio.electric~~ signal interconversion elements are connected to the computer components in the holder to form a holder. An opening is formed on the surface of the outside of the holder to form a hole for communicating with the radio propagation bus space through a radio line. In case a plurality of the holders of the same structure are arranged to be side by side to match the holes of the holders, the radio propagation buses in the plurality of the holders are arranged so as to be mutually communicated with each other through the matched holes, and as a result, the computer components in each holder are linked by means of the radio by the arrangement of the plurality of holders being disposed contiguous to each other.

BRIEF DESCRIPTION OF THE DRAWINGS:

FIG. 1 shows a crossectional explanatory drawing of coupled-type ~~coupled type~~ computers according to the present invention.

Fig. 2 shows an explanatory exterior appearance drawing of the coupled-type ~~coupled type~~ computers according to the present invention.

FIG. 3 shows a crosssectional explanatory drawing of the ensemble-type ~~ensemble type~~ computers formed by the coupled-type ~~coupled type~~ computers according to the present invention.

FIG. 4 shows a block explanatory drawing of ~~a radio, electric~~ radio-electric signal interconvsersion elements.

DETAILED DESCRIPTION OF THE INVENTION:

The embodiments of the present invention will now be described in details with reference ~~by referring~~ to the attached drawings ~~in the following~~.

In FIG. l, reference numeral (2) shows coupled-type ~~coupled type~~ computers, wherein computer components which are necessary for constituting a server such as a plurality of CPUs (6) (central processing unit), a memory (Mem) (8), a switching regulator (not shown) and the like are built in a cubic holder (4) consisting of silicone and other similar materials.

A radio propagation bus space (10) consisting of a spherical cavity is formed in the center of the interior of the holder (4). A plurality of radio-electric ~~radio.electric~~ signal interconversion elements (12) are disposed in the inside portions of the holder (4) which faces the radio propagation bus space (10), and an interface unit (14) (see FIG. 4) of each radio-electric

~~radio.electric~~ signal interconversion element (12) is connected to an input/output of the components of the computer such as a corresponding CPU (6), memory (8), and the like. A plurality of radio lines (16) consisting of columnar holes are formed on the cubic holders (4).

The opening portion of each radio line (16) opens to the center of each hexahedron of the holder (4), and each radio line (16) is communicated with the radio propagation bus space (10) of the inside of the holder (4). The radio propagation bus space (10) and the radio line (16) constitute a radio propagation space for propagating the radio (including light) emitted from the radio-electric ~~radio.electric~~ signal interconversion element (12) in a ~~the~~ predetermined direction while reflecting ~~it~~ the radio.

As illustrated in FIG. 4, the radio-electric ~~The radio.electric~~ signal interconversion element (12) comprises an interface unit (14) , a transmission/reception signal processing unit (18), a feeding unit (20), and a transmission/reception microarray antenna (22). These ~~, and those~~ units are chipped, and are fixed to the holder (4). The transmission/reception signal processing unit (18) constitutes a signal discrimination means for performing an extraction of ~~a~~ identification information contained in the reception signal, and a selection of the reception signal. Furthermore, the transmission/reception signal processing unit (18) performs an error processing of the transmission/reception signal and multi-pass ~~multi pass~~ and a fusing countermeasure and the like.

In the foregoing construction, a plurality of the CPU (6) memories (8) in the single holder (4) are mutually connected in a spacewise manner by means of the radio propagation bus space (10), and as a whole, forms a parallel computer. In the single holder (4), the CPU (6) sends the radio to the opposite CPU (6) through the radio-electric ~~radio.electric~~ signal interconversion element (12) and also receives the reception signal from the opposite CPU (6) through the radio-electric ~~radio.electric~~ signal interconversion element (12).

At this time, a signal processing unit (18) of the radio-electric ~~radio.electric~~ signal interconversion element (12) connected to a plurality of the CPUs (6) that handle the information processes ID information, a channel and a ~~,~~ time slot, and selects a receiving unit. The memory (8) can be read and written from the CPU (6) by the radio propagating over the radio propagation bus space (10) as if the memory (8) were ~~it is~~ connected to the bus.

As illustrated in ~~the~~ FIG. 3, ~~shows~~ each of a plurality of the holders (4) of the same structures, when they are laid one on top of another and being adjacent to each other, which

constitutes a cubic shape as a whole, and the radio lines (16) opening to the adjacent surfaces of the adjacent holder (4) are mutually in tight contact and are communicated, whereby the radio propagation bus spaces (10) of the inside of the adjacent holders (4) are mutually communicated.

A computer component of one holder (4) among a plurality of the holders (4) that are coupled like a pair to form a cubic shape can mutually perform an exchange of data of the computer component of a ~~the~~ desired other ~~another~~ holder (4) through the radio line (16) and the radio propagation bus space (10).

As shown in FIG. 3, the radio (24) propagated from the ~~#1~~ CPU #1 (6) in one holder (4) among a plurality of the ~~many~~ holders (4) through the radio-electric ~~radio.electric~~ signal interconversion element (12) is transmitted to the desired ~~#2~~ CPU #2 (6) while reflecting the radio propagation space formed by the radio propagation bus space (10) and the radio line (16).

In the radio propagation space where a plurality of holders (4) are mutually communicated, a medium for cooling is caused to flow, and the computer component such as the CPU (6) or the memory (8) and the like which approaches or faces the cavity, namely, the radio propagation bus space (10), are cooled. Furthermore, a power source energy is fed to the radio propagation bus spaces (16) and cavity (10) by using the radio, and the power source energy is supplied to the computer component such as each CPU (6) or memory (8) and the like through the radio-electric ~~radio.electric~~ signal interconversion element (12).

For reference, in this embodiment, the shape of the holder is assumed to be of a cubic type, but it is not particularly ~~particurly~~ limited to a ~~the~~ cube, and any shape may be chosen as long as the cavity (10) is provided for joint use through the radio line (16) in each holder.

The present invention has been constructed as described in the foregoing, and there are many effects such as a great many computers can be coupled in high density in a compact space, and moreover the codeless mode can be applied to this system.

ABSTRACT ~~OF THE DISCLOSURE:~~

The ~~An object of the~~ present invention provides ~~is to provide a~~ coupled-type ~~coupled type~~ computers wherein a computer can be coupled with computers of the same structure easily, and ~~moreover, it~~ can be coupled with other computers of the same structure in high density. Computer ~~, and wherein computer~~ components such as CPUs ~~(6)~~ or memories ~~(8) and the like~~ are built in a holder ~~(4)~~ made of polyhedron cube. A radio propagation bus space ~~(10)~~ formed by a cavity is provided in the inside of the holder ~~(4)~~, and a plurality of radio-electric ~~radio.electric~~ signal interconversion elements ~~(12)~~ provided with a signal identification means facing the radio propagation bus space ~~(10)~~ are disposed in the holder ~~(4)~~. These radio-electric ~~radio, electric~~ signal interconversion elements ~~(12)~~ are connected to the computer components in the holder ~~(4)~~. Holes communicating with the radio propagation bus space ~~(10)~~ are bored on the surfaces of the outsides of the holders ~~(4)~~ by means of the radio lines ~~(16)~~. When the holes of the holders ~~(4)~~ are matched by causing a plurality of the holders ~~(4)~~ of the same structure to be adjacent to one another, the radio propagation bus space ~~(10)~~ in a plurality of the holders ~~(4)~~ are mutually communicated through the matched holes, and the computer components in each holder ~~(4)~~ are coupled by means of the radio by causing the plural holders ~~(4)~~ to be adjacent to one another.